AMENDMENTS TO THE CLAIMS

The listing of claims below will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A bioreactor, comprising:

(a) a housing having an inner side comprising: a gas introduction means integral to the housing; and a gas expiration means integral to the housing;

(b) a plurality of modules of hollow fibers, residing within the housing, each module comprising:

(i) at least three coaxially arranged hollow fibers, each hollow fiber having an inner side and an outer side, including an innermost hollow fiber and an outermost hollow fiber;

(ii) at least three compartments, comprising: a first compartment defined by an inner side of an innermost hollow fiber and at least two compartments defined by a respective annular space between adjacent fibers of the at least three coaxially arranged hollow fibers; and

(c) an outermost compartment defined by a space within the inner side of the housing which is not occupied by the plurality of modules[.];

in which at least one compartment is charged with a gaseous nutrient substantially free of non-gaseous fluids.

2. (Original) The bioreactor of claim 1, where the hollow fibers are semipermeable.

3. (Original) The bioreactor of claim 2, where the hollow fibers comprise a material selected from the group consisting of polysulfone, polypropylene, nylon, polyester, polytetrafluoroethylene, cellulose acetate, and mixed esters of cellulose.

4. (Original) The bioreactor of claim 1, where the first compartment, the at least one additional compartment and the outermost compartment each further comprise at least one inlet port and at least one outlet port.

5. (Original) The bioreactor of claim 1, where the bioreactor further comprises at least 10^9 cells.

6. (Original) The bioreactor of claim 5, where the cells are liver cells.

7. (Original) The bioreactor of claim 6, where the liver cells are selected from the group consisting of porcine liver cells and human liver cells.

8. (Original) The bioreactor of claim 4, where the housing further comprises at least one inlet manifold and at least one outlet manifold for the first compartment and at least one inlet manifold and at least one outlet manifold for each additional compartment.

9. (Original) The bioreactor of claim 8, where at least one manifold further comprises a flow distributor.

10. (Original) The bioreactor of claim 9, where at least one compartment further comprises an extracellular matrix.

11. (Original) The bioreactor of claim 1, where at least one annular space is about 0.2 millimeters to about 0.8 millimeters.

12. (Original) The bioreactor of claim 1, where the bioreactor is sterilized by a means selected from the group consisting of autoclaving, ethylene oxide and gamma radiation.

13. (Original) The bioreactor of claim 1, wherein the innermost hollow fiber has a length of about 2 centimeters to about 50 centimeters.

14. (Original) The bioreactor of claim 8, where the housing has a first end and a second end, and

where each inlet port and each exit port are at the first end of the housing.

15. (Original) The bioreactor of claim 8, further comprising:

microfibers substantially parallel to the modules of hollow fibers.

16. (Original) The bioreactor of claim 15, where the microfibers further comprise at least one aeration inlet port and at least one aeration outlet port.

17. (Original) The bioreactor of claim 1, where at least one coaxial hollow fiber is saturated with perfluorocarbon.

18. (Original) The bioreactor of claim 1, where at least one coaxial hollow fiber has a pore size less than 1×10^{-6} m.

19. (Original) The bioreactor of claim 1, where at least one coaxial hollow fiber has a pore size less than 0.1×10^{-6} m.

20. (Original) The bioreactor of claim 1, where at least one coaxial hollow fiber has a pore size less than 0.05×10^{-6} m.

21. (Original) The bioreactor of claim 1, where at least one compartment further comprises cells mixed with an extracellular matrix.

22. (Original) A method of supplying cell biosynthesis products to a patient in need thereof, comprising: pumping intravenous feeding solution through a compartment of the bioreactor of claim 5; collecting the output; and intravenously feeding the output to the patient.

23. (Currently amended) A serially-linked bioreactor, comprising a plurality of bioreactor subunits, each bioreactor subunit comprising:

(a) a housing having an inner side comprising: a gas introduction means integral to the housing; and a gas expiration means integral to the housing;

(b) a plurality of modules of hollow fibers, residing within the housing, each module comprising:

(i) at least three coaxially arranged hollow fibers, each hollow fiber having an inner side and an outer side, including an innermost hollow fiber and an outermost hollow fiber;

(ii) at least three compartments, comprising: a first compartment defined by an inner side of an innermost hollow fiber; and at least two compartments defined by a respective annular space between adjacent fibers of the at least three coaxially arranged hollow fibers; and

(c) an outermost compartment defined by a space within the inner side of the housing which is not occupied by the plurality of modules; and

(d) at least one compartment of one bioreactor subunit linked serially to at least one compartment of at least one other bioreactor subunit[.];

in which at least one compartment is charged with a gaseous nutrient substantially free of non-gaseous fluids.

24. (Original) The bioreactor of claim 23, where each bioreactor subunit further comprises at least 10^9 cells.

25. (Original) The bioreactor of claim 24, where the cells are liver cells.

26. (Original) The bioreactor of claim 25 where the cells are selected from the group consisting of human liver cells and porcine liver cells.

27. (Original) The bioreactor of claim 24, where at least one compartment of each bioreactor subunit further comprises an extracellular matrix.

28. (Original) A method of treating a patient in need thereof comprising:

(a) introducing plasma of a patient into a bioreactor subunit of the serially linked bioreactor of claim 23,

(b) forcing at least a portion of the plasma to flow radially through a cell compartment of the bioreactor subunit to form a biotransformed effluent;

(c) introducing the biotransformed effluent into a second bioreactor subunit of the bioreactor of claim 23;

(d) forcing at least a portion of the biotransformed effluent to flow radially through a cell compartment of the second bioreactor subunit to form supplemented plasma; and

(e) returning the supplemented plasma to the patient's circulatory system.

29. (Cancelled)

30-48. (Withdrawn)